UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

NOAA Fisheries No:
2004/00660

July 26, 2004

Mr. Lawrence C. Evans
Portland District, Corps of Engineers
CENWP-OP-GP (Ms. Kathryn L. Harris)
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Endangered Species Act Interagency Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Rock Creek Streambank Stabilization Project (Corps No.:200400423), Rock Creek, Rock Creek/Tualatin River 5th field (HUC:1709001004), Washington County, Oregon (Corps No.: 200400423)

Dear Mr. Evans:

The enclosed document contains a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) on the effects of the Rock Creek Streambank Stabilization Project. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of Upper Willamette River steelhead (*Oncorhynchus mykiss*). The Opinion also includes an incidental take statement with terms and conditions necessary to minimize the impact of taking that is reasonably likely to be caused by this action. Take from actions by the action agency and applicant, if any, that meet these terms and conditions will be exempt from the ESA take prohibition.

This document also includes the results of our consultation on the action's likely effects on essential fish habitats (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NOAA Fisheries within 30-days after receiving these recommendations. If the response is inconsistent with the recommendations, the Corps must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations.

If you have questions regarding this consultation, please contact Ron Lindland, Fisheries Biologist, Oregon State Habitat Office Willamette Branch, at 503.231.2315.

Sincerely,

Russell M Strach for

D. Robert Lohn
Regional Administrator

Endangered Species Act – Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Rock Creek Streambank Stabilization Project,
Rock Creek/Tualatin River (HUC#1709001004),
Washington County, Oregon
(Corps No.: 200400423)

Lead Action Agency:	U. S. Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	July 26, 2004
Issued by:	Russell M Strach for _____ D. Robert Lohn Regional Administrator
NOAA Fisheries No.:	**2004/00660**

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INTRODUCTION

The biological opinion (Opinion) and incidental take statement of this consultation were prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) in accordance with section 7(a)(2) the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 *et seq*.), and implementing regulations at 50 CFR 402. The essential fish habitat (EFH) part of this consultation was prepared in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 USC 1801 *et seq*.) and implementing regulations at 50 CFR 600. The administrative record for this consultation is on file at the Oregon State Habitat Office of NOAA Fisheries at 525 NE Oregon Street, Portland, Oregon 97232.

Background and Consultation History

On June 9, 2004, NOAA Fisheries received a letter dated June 8, 2004, and an accompanying May 20, 2004, biological assessment (BA) from the U.S. Army Corps of Engineers (Corps), Portland, Oregon District, requesting formal ESA and MSA consultation on the effects of issuance of a permit for a proposed streambank stabilization project on Rock Creek (Rock Creek/Tualatin River 5th field watershed) at River Mile (RM) 5.2 on Upper Willamette River (UWR) steelhead (*Oncorhynchus mykiss*). In the BA, the Corps determined that the proposed project is "likely to adversely affect" (LAA) UWR steelhead.

NOAA Fisheries listed UWR steelhead as threatened under the ESA on March 25, 1999 (64 FR 14517). NOAA Fisheries issued protective regulations for UWR steelhead under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

The objective of this Opinion is to determine whether the activities associated with the Rock Creek Streambank Stabilization Project are likely to jeopardize the continued existence of UWR steelhead.

The objective of the essential fish habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action.

Proposed Action

The proposed action is the issuance of a permit to the City of Hillsboro, Oregon, by the Corps under section 404 of the Clean Water Act to authorize the Rock Creek Streambank Stabilization Project on the west bank of Rock Creek near RM 5.2 (Tax lot #4800; NW1/4 of Section 38, T1S, R2W). According to the BA, the purpose of the project is to stabilize an eroding streambank in a City of Hillsboro open space tract beside Noble Woods Park and private residences. The proposed action would authorize the following activities:

- Excavation of a toe trench which would be lined with filter fabric and filled with riprap material to the ordinary high water (OHW) elevation at the site (OHW elevation is 131.7 feet) along approximately 130 lineal feet of the west streambank;

- Installation of a stacked geocell revetment on top of the rock toe from elevation 131.7 to 141.7;

- Placement of two fabric encapsulated soil lifts on top of the stacked geocells;

- Placement of large woody material (logs with rootwads attached) along the toe of the slope; and,

- Planting of native riparian shrubs and native grass seed mix on the stacked geocell revetment and fabric encapsulated soil lifts.

General Construction

The project area will be staked by the contractor to demarcate the construction disturbance limits as shown in the project plans (Appendix A of the BA) and approved by the project engineer before mobilization of equipment and material to the project site. Clearing or grubbing of existing vegetation is not expected to be necessary. Should minimal areas require clearing, affected plants will be salvaged and stored for subsequent replanting where possible.

The contractor will stake and mark streambank construction lines and elevations and install all necessary erosion control measures at the stockpile and staging area and along the areas of disturbance as shown on the project plans (Appendix A of the BA). Erosion control measures shall consist of all necessary measures required to prevent and contain potential soil erosion.

The in-water work area will be isolated by installing coffer dams or steel plates in Rock Creek at the upstream and downstream ends of the project area. Once the work area is isolated, it would be dewatered using pumps. Fish salvage and relocation will be performed during dewatering of the channel, and will be supervised by a qualified fishery biologist. The flow in Rock Creek at the project site during the time the project would be completed would be approximately 3 cubic feet per second (cfs). Water will be bypassed around the dewatered area to maintain flow in Rock Creek downstream from the project site. In-water work is expected to take approximately three weeks to complete.

Upon completion of the site dewatering and fish salvage, logs would be placed on the stream bottom at the downstream end of the dewatered area to allow temporary access of equipment to the east streambank. These logs would be removed, upon completion of the project. The contractor would excavate the toe trench along the west streambank, place the filter fabric liner and riprap, excavate native material from the existing streambank to recontour it, and reconstruct the streambank according to the design plans.

Approximately 450 cubic yards of material would be excavated from the toe trench and existing streambank below the OHW elevation. Excess excavated material would be hauled off-site and disposed of in an appropriate upland location. Approximately 200 cubic yards of 4- to 12-inch rock would be placed in the toe trench and up to the OHW elevation on the streambank. A layer of smaller, gravel-size substrate would be placed over the riprap material on the flat portion of the toe trench to potentially be used for spawning by cutthroat trout.

The stacked geocell design allows construction of a stable streambank slope of 0.5-foot horizontal to 1.0-foot vertical. The stacked geocell will be filled with soil to provide a planting medium and allow the establishment of native riparian vegetation on the streambank. Each layer of stacked geocell will be wrapped at the face with biodegradable coir fabrics to provide temporary containment of backfilled soils while vegetation becomes established. The fabric encapsulated soil lifts to be placed on top of the stacked geocells will also assist with retaining backfilled soils. The soil lifts will also utilize biodegradable coir fabric to provide erosion control through the establishment period for vegetation planted within the lifts.

Large woody material (LWM) will be anchored to the riprap material along the toe of the streambank. The logs will range in length from 15 to 20 feet and will be 12 to 24 inches in diameter. Approximately 50% of the pieces will have rootwads attached.

Following completion of construction activities, the contractor shall clean up all disturbed areas, the construction site, and the staging area. The contractor shall remove all excess or remaining construction materials from the site.

Areas within the limits of disturbance will be seeded with a specified native seed mix. Erosion control measures will be removed following stabilization of disturbed areas. Riparian vegetation (grasses and shrubs) will be planted by the contractor.

Conservation Measures

Project activities would include conservation measures which would limit or eliminate impacts associated with the project. These conservation measures are designed to limit the work area and provide barriers to potential sediment pathways to Rock Creek downstream from the project area. Isolation of the in-water work area is expected minimize the effects of turbidity, sedimentation, chemical spills, and chemical/nutrient loading on ESA-listed salmonids and their habitat in Rock Creek. Conservation measures were described in the BA, and are summarized as follows:

Control of Turbidity/Suspended Sediments

- The in-water work area would be isolated by installation of coffer dams or steel plates at the upstream and downstream ends of the project area and dewatered by pumping.

- Construction activities will occur when Rock Creek is at low, summer flow conditions. Stream flow at the project site would be approximately 3 cfs.

- During the construction period, the contractor will upgrade sediment control structures as needed for unexpected storm events and to ensure that sediment and sediment-laden water do not leave the project site.

- The contractor shall ensure that a supply of emergency erosion control materials (*i.e.*, silt fence, straw bales) are on site.

- Sediment will be removed from erosion control structures once it has reached 1/3 of the height of the control.

Timing of Construction Activities

- All in-water work shall be completed during the preferred in-water work period for Rock Creek between July 1 and September 30, when UWR steelhead are least likely to be present. In-water work will not be allowed outside of this period without prior written approval from NOAA Fisheries.

Fish Rescue and Relocation

- Fish which may become stranded when the in-water work area is isolated and pumped out will be rescued using nets, seines, or electrofishing equipment; then transported and released downstream from the project site.

Water Quality and Construction Monitoring

- All vehicle staging, cleaning, maintenance, refueling, and fuel storage will be 150 feet or more from any stream, waterbody or wetland.

- All construction debris will be properly disposed of on land in such a manner that it cannot enter into the waterway or cause water quality degradation.

- Instream turbidity will be monitored during construction and erosion controls inspected daily during rainy periods and weekly during dry periods or more often as necessary to ensure the erosion controls are working adequately.

- If monitoring shows that the erosion controls are ineffective, work crews will be mobilized immediately to make repairs, install replacements, or install additional controls as necessary.

- The contractor is responsible for providing a spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

Revegetation

- The stacked geocells on the sloped portion of the streambank above OHW elevation and the encapsulated soil lifts at the top of the bank will be planted with native riparian shrub species.

- Disturbed areas beside Rock Creek will be seeded with a native seed mix.

Action Area

'Action area' means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For purposes of this consultation, the action area is the streambed and streambanks of Rock Creek beside the work area and downstream to the limit of visible turbidity increases resulting from construction activities associated with the project.

Rock Creek provides spawning, rearing, and migratory habitat for both adult and juvenile life stages of UWR steelhead. No spawning habitat is available in the project area. Juvenile UWR steelhead may be rearing in the action area at the time of project implementation. Adult steelhead would not be present, nor would eggs or alevins be present in the stream substrate. Stream substrate in the project area consists mainly of clayey silts. Rock Creek has been designated as EFH for Chinook and coho salmon (PFMC 1999).

ENDANGERED SPECIES ACT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA Fisheries, as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their critical habitats.

Section 9(a)(1) and protective regulations adopted pursuant to section 4(d) of the ESA prohibit the 'taking' of listed species without a specific permit or exemption. Among other things, an action that harasses, wounds, or kills an individual of a listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 CFR 222.102). 'Incidental take' refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(o)(2) exempts any taking in compliance with the terms and conditions of a written incidental take statement from the taking prohibition.

Biological Opinion

This Opinion presents NOAA Fisheries' review of the status of each evolutionarily significant unit (ESU)[1] considered in this consultation, the environmental baseline for the action area, all the effects of the action as proposed, and cumulative effects. NOAA Fisheries analyzes those combined factors to conclude whether the proposed action is likely to appreciably reduce the likelihood of both the survival and recovery of the affected ESU. See, 50 CFR 402.14(g). If the action under consultation is likely to jeopardize an ESU, NOAA Fisheries must identify any reasonable and prudent alternatives for the action that avoid jeopardy and meet other regulatory requirements (50 CFR 402.02).

Status of the UWR steelhead ESU

This section defines range-wide biological requirements of each ESU, and reviews the status of the ESUs relative to those requirements. The present risk faced by each ESU informs NOAA Fisheries' determination of whether additional risk will 'appreciably reduce' the likelihood that an ESU will survive and recover in the wild. The greater the present risk, the more likely any additional risk resulting from the proposed action's effects on the population size, productivity (growth rate), distribution, or genetic diversity of the ESU will be an appreciable reduction (see, McElhaney *et al.* 2000).

The status of UWR steelhead was initially reviewed by NOAA Fisheries in 1996 (Busby *et al.* 1996), and a more recent review occurred in 1999 (NMFS 1999a). In the 1999 review, the Biological Review Team (BRT) noted several concerns for this ESU, including the relatively low abundance and steep declines since 1988. The previous BRT was also concerned about the potential negative interaction between non-native summer steelhead and wild winter steelhead. The previous BRT considered the loss of access to historical spawning grounds because of dams a major risk factor. The 1999 BRT reached a unanimous decision that the UWR steelhead ESU was at risk of becoming endangered in the foreseeable future.

New data for UWR steelhead include redd counts and dam/weir counts through 2000, 2001, and 2002, and estimates of hatchery fraction and harvest rates through 2000. New analyses for this update include the designation of demographically independent populations, and estimates of current and historically available kilometers of stream.

As part of its effort to develop viability criteria for UWR steelhead, the Willamette/Lower Columbia Technical Recovery Team has identified historically demographically independent populations (Myers *et al.* 2003). Population boundaries are based on an application of Viable Salmonid Populations (VSP) definition (McElhany *et al.* 2000). Myers *et al.* hypothesized that

[1] 'ESU' means an anadromous salmon or steelhead population that is either listed or being considered for listing under the ESA, is substantially isolated reproductively from conspecific populations, and represents an important component of the evolutionary legacy of the species (Waples 1991). An ESU may include portions or combinations of populations more commonly defined as stocks within or across regions.

the ESU historically consisted of at least four populations (Molalla, North Santiam, South Santiam, and Calapooia) and possibly a fifth (Coast Range). The historical existence of a population in the coast range is uncertain. The populations identified in Myers *et al.* (2003) are used as the units for the new analyses in the BRT (2003) report.

Based on the updated information provided in the BRT (2003) report, the information contained in previous UWR steelhead ESU status reviews, and preliminary analyses by the Willamette Lower Columbia Technical Review Team, NOAA Fisheries could not conclusively identify a single population that is naturally self-sustaining. All populations are relatively small, with the recent mean abundance of the entire ESU at less than 6,000. Over the period of the available time series, most of the populations are in decline. The recent elimination of the winter-run hatchery production will allow estimation of the natural productivity of the populations in the future, but the available time series are confounded by the presence of hatchery-origin spawners. On a positive note, the counts all indicate an increase in abundance in 2001, likely due in part to improved marine conditions.

Because coastal cutthroat trout is a dominant species in the Willamette River basin, resident steelhead are not as widespread here as in areas east of the Cascades. Resident fish below barriers are found in the Pudding/Molalla, Lower Santiam, Calapooia, and Tualatin drainages, and these would be considered part of the steelhead ESU based on the provisional framework discussed in the general introduction (BRT 2003). Resident fish above Big Cliff and Detroit Dams on the North Fork Santiam and above Green Peter Dam on the South Fork Santiam are of uncertain ESU affinity. Although no obvious physical barrier separates populations upstream from the Calapooia from those lower in the basin, resident steelhead in these upper reaches of the Willamette River basin are quite distinctive both phenotypically and genetically and are not considered part of the steelhead ESU.

The majority (over 76%) of the 2003 BRT votes for this ESU fell in the ‘likely to become endangered’ category, with small minorities falling in the ‘danger of extinction’ and ‘not likely to become endangered’ categories. The BRT did not identify any extreme risks for this ESU but found moderate risks in all the VSP categories, ranging from moderately low for diversity to moderate spatial structure and growth rate/productivity. On a positive note, after a decade in which overall abundance (Willamette Falls count) hovered around the lowest levels on record, adult returns for 2001 and 2002 were up significantly, on par with levels seen in the 1980s. Still, the total abundance is small for an entire ESU, resulting in a number of populations that are each at relatively low abundance. The recent increases are encouraging but it is uncertain whether they can be sustained. The 2003 BRT considered it a positive sign that releases of the ‘early’ winter-run hatchery population have been discontinued, but remained concerned that releases of non-native summer-run steelhead continue.

Environmental Baseline

The 'environmental baseline' includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02). For projects that are ongoing actions, the effects of future actions over which the Federal agency has discretionary involvement or control will be analyzed as 'effects of the action.'

NOAA Fisheries describes the environmental baseline in terms of the biological requirements for habitat features and processes necessary to support life stages of the subject ESU within the action area. When the environmental baseline departs from those biological requirements, the adverse effects of a proposed action on the ESU or its habitat are more likely to jeopardize the listed species or result in destruction or adverse modification of critical habitat (NMFS 1999b). The biological requirements of salmon and steelhead in the action area vary depending on the life history stage present and the natural range of variation present within that system (Groot and Margolis 1991, NRC 1996, Spence *et al.* 1996).

Generally, during spawning migrations, adult steelhead and salmon require clean water with cool temperatures and access to thermal refugia, dissolved oxygen near 100% saturation, low turbidity, adequate flows and depths to allow passage over barriers to reach spawning sites, and sufficient holding and resting sites. Anadromous fish select spawning areas based on species-specific requirements of flow, water quality, substrate size, and groundwater upwelling. Embryo survival and fry emergence depend on substrate conditions (*e.g.*, gravel size, porosity, permeability, and oxygen concentrations), substrate stability during high flows, and, for most species, water temperatures of 13˚C or less. Habitat requirements for juvenile rearing include seasonally suitable microhabitats for holding, feeding, and resting. Migration of juveniles to rearing areas, whether the ocean, lakes, or other stream reaches, requires unobstructed access to these habitats. Physical, chemical, and thermal conditions may all impede migrations of adult or juvenile fish.

The UWR steelhead ESU considered in this Opinion resides in or migrates through the action area. Thus, for this action area, the biological requirements for salmon and steelhead are the habitat characteristics that would support successful juvenile rearing and adult and juvenile migration for UWR steelhead.

Environmental baseline conditions within the action area were evaluated for the subject action at the project level and watershed scales. This evaluation was based on the "matrix of pathways and indicators (MPI) described in "Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale" (NMFS 1996). This method assesses the current condition of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

In general, the Rock Creek watershed has experienced considerable past disturbance in all areas of the watershed including wetlands, floodplain, riparian habitats, and aquatic refugia. None of the 16 habitat indicators for which data were available in the MPI were rated as properly functioning. Four of the 16 indicators were rated as functioning "at risk." These were physical barriers, off-channel habitat, refugia, and floodplain connectivity. The other 12 indicators (temperature, sediment, chemical contamination/nutrients, substrate, LWM, width/depth ratio, streambank condition, peak/base flows, drainage network increase, road density and location, disturbance history, and riparian reserves) were rated as not properly functioning. The environmental baseline conditions for each habitat indicator in the MPI are described in the BA and incorporated herein by reference.

Rock Creek, inclusive of the project site, is currently listed on the Oregon Department of Environmental Quality (ODEQ) 303(d) List of Water Quality Limited Waterbodies (ODEQ 2002). Rock Creek is listed for bacteria (fecal coliform), chlorophyll a, temperature, and dissolved oxygen.

On the project site, lawn grass extends to the top of the streambank (the west bank) that is failing. The failing streambank is nearly vertical, with little vegetation. On the opposite streambank, an overstory of red alder, big-leaf maple, and Oregon ash is present, with common shrub species including red dogwood, willow, and snowberry. Reed canarygrass is common throughout the project area.

Effects of the Action

'Effects of the action' means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). If the proposed action includes offsite measures to reduce net adverse impacts by improving habitat conditions and survival, NOAA Fisheries will evaluate the net combined effects of the proposed action and the offsite measures.

'Indirect effects' are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects may occur outside the area directly affected by the action, and may include other Federal actions that have not undergone section 7 consultation but will result from the action under consideration. To be considered indirect effects, such actions must be reasonably certain to occur, as evidenced by appropriations, work plans, permits issued, or budgeting; follow a pattern of activity undertaken by the agency in the action area; or be a logical extension of the proposed action.

'Interrelated actions' are those that are part of a larger action and depend on the larger action for their justification; 'interdependent actions' are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Future Federal actions that are not a direct effect of the action under consideration, and not included in the environmental baseline or treated as indirect effects, are not considered in this Opinion.

Effects on ESA Listed Species

For the proposed Rock Creek Streambank Stabilization Project, potential direct effects could include death or harm of UWR steelhead resulting from in-water work (coffer dam/steel plate installation and removal), dewatering of the isolated work area, and rescue and release of fish from the isolated work area. Potential indirect effects include behavioral changes of UWR steelhead resulting from increased stream turbidity, and long-term improvement in aquatic habitat at the site resulting from the stabilization of the streambank. There are no interrelated or interdependent effects from the proposed project.

Installation of coffer dams/steel plates in Rock Creek to isolate the in-water work area will disturb streambed sediment and result in a short-term increase in stream turbidity in Rock Creek at the project site and possibly for a short distance downstream. Once the coffer dams/steel plates are installed and the area between them is dewatered, the remainder of instream work (toe trench excavation, riprap placement, placement of LWM, placement of the temporary log crossing) will be done in isolation from flowing water. Because the work area will be isolated from flowing water, sediment transport and turbidity increases in Rock Creek downstream from the project site are expected to be minimized. Removal of the coffer dams/steel plates once streambank stabilization work is completed would also cause disturbance of streambed sediment.

Streams are dynamic systems that naturally alter their courses in response to many physical processes. Roadways and other structures constructed along waterways are subject to flooding and undercutting as a result of these natural changes in the stream course. Structural hardening of embankments is the traditional means of protecting these structures along waterways.

Hardened embankments simplify stream channels, alter hydraulic processes, and prevent natural channel adjustments (Spence *et al.* 1996). Moreover, embankment hardening may shift the erosion point either upstream or downstream from the project site and contribute to stream velocity acceleration. As amplified erosive forces attack different locations and landowners respond with more bank hardening, the river eventually attains a continuous fixed alignment lacking habitat complexity (USACE 1977).

Fish habitats are enhanced by the diversity of habitats at the land-water interface and adjacent bank (USACE 1977). Streamside vegetation provides shade that reduces water temperature. Overhanging branches provide cover from predators. Insects and other invertebrates that fall from overhanging branches may be preyed on by fish, or provide food sources for other prey organisms. Immersed vegetation, logs, and root wads provide points of attachment for aquatic prey organisms, create shelter from swift currents during high flow events, retain bed load materials, create pools, and reduce flow velocity.

The most desirable method of bank protection is revegetation. However, revegetation alone can seldom stabilize banks steeper than 3:1 (horizontal:vertical) or areas of high velocity and wave action (USACE 1977). Although they are biologically less desirable, fixed structures provide the most reliable means of bank stability. The use of structural measures should be a last resort.

Combining structural measures such as sloped riprap or mechanically stabilized earth walls, vegetation and LWM is preferable to a structural solution without vegetation (USACE 1977).

For the proposed project, limiting the placement of riprap to the toe of the slope, use of stacked geocells, use of encapsulated soil lifts, and planting native riparian shrubs on the geocells and soil lifts will minimize the negative effect of riprap by allowing vegetation to become established in the geocells on the streambank slope and at the top of the streambank. In addition, the incorporation along the toe of the slope of LWM with rootwads attached is expected to result in increased habitat complexity at the site.

In-Water Work

In-water work would be completed during the preferred period between July 1 and September 30 when UWR steelhead are least likely to be present in the project area. However, juvenile UWR steelhead may occur year-round in the reach of Rock Creek that is addressed in this Opinion. Few, if any, juveniles are expected to be present in Rock Creek at the project site because the out-migration of smolts will have already occurred, because of warm water temperatures during the time of project construction, and because of lack of other suitable habitat conditions for juvenile salmonid rearing in the project area. Therefore, the potential for juvenile UWR steelhead to be within the dewatered area is minimal.

Water Quality - Turbidity, Potential Spills

At moderate levels, turbidity can reduce primary and secondary productivity and, at high levels, turbidity can interfere with feeding and can injure and kill both adult and juvenile fish (Spence *et al.* 1996, Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments can also reduce primary and secondary productivity (Spence *et al.* 1996), and reduce incubation success and interstitial rearing space for juvenile salmonids (Bjornn and Reiser 1991). Salmonid fishes have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Servizi and Martens 1991). Juvenile salmonid fishes tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish must traverse these streams along migration routes (Lloyd *et al.* 1987). In contrast, turbid water can provide cover and refuge from predation from piscivorous fish and birds (Gregory and Levings 1998). In habitats with intense predation pressure, this provides a beneficial trade-off of enhanced survival in exchange for physical effects such as reduced growth.

Exposure duration is a critical determinant of whether turbidity causes physical or behavioral effects and the extent of those effects (Newcombe and MacDonald 1991). Salmonids have evolved in waters that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with floods, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, chronic exposure can cause physiological stress that can

increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Behavioral avoidance of turbid waters by juvenile salmonids may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987).

As mentioned above, the in-water work area will be isolated and de-watered before beginning construction of streambank stabilization measures. Sediment control measures are expected to minimize transport of sediment and resultant turbidity increases in Rock Creek at the project site and downstream. Therefore, NOAA Fisheries believes that the proposed actions would cause only a minor, short-term increase in stream turbidity in Rock Creek at the site and for a short distance downstream.

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of heavy equipment requires the use of fuels and lubricants which, if spilled in the stream channel or riparian area can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons (PAHs) which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). The potential for pollutants to enter the stream will be minimized by staging fuels and equipment in approved areas, by having a spill-control plan, and by having spill-control materials on site.

Ground Disturbance

All areas that are disturbed by construction activities associated with the proposed project will be planted with native varieties of vegetation. As the vegetation matures over time, it will contribute to the improvement of habitat functions. No existing large trees will be removed in the action area. Therefore, there will be minimal impacts to salmonids from this activity.

Beneficial Effects

The proposed project is expected to result in some beneficial effects at the project site over time. These are: (1) Reconstructing and stabilizing the streambank will reduce fine sediment contributions to Rock Creek from mass wasting events, and provide suitable site conditions for establishment of riparian vegetation; (2) establishment of riparian vegetation at the project site will likely provide increased stream shading, streambank stability, and organic matter to Rock Creek; and (3) large woody material (logs with rootwads), which is currently lacking in this stream reach, will be placed along the reconstructed streambank.

Cumulative Effects

'Cumulative effects' are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Cumulative effects that reduce the capacity of listed ESUs to meet their biological requirements in the action area increase the risk to the ESU that the effects of the proposed action on the ESU or its habitat will result in jeopardy (NMFS 1999b). NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater impacts to listed species or their habitat than presently occurs.

Between 1990 and 2000, the population of Washington County, Oregon increased by 42.9%.[2] Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises. As the human population in the action area continues to grow, demand for agricultural, commercial, or residential development is also likely to grow. The effects that new development that are caused by that demand are likely to further reduce the conservation value of habitat within the action area.

Although quantifying an incremental change in survival for the ESUs considered in this consultation due to the cumulative effects is not possible, it is reasonably likely that those effects within the action area will have a small, short-term, negative effect, and, potentially, a long-term beneficial effect on the likelihood of their survival and recovery of UWR steelhead.

Conclusion

After reviewing the best available scientific and commercial information regarding the biological requirements and the status of the UWR steelhead considered in this Opinion, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, NOAA Fisheries' concludes that the action, as proposed, is not likely to jeopardize the continued existence of this species.

This conclusion is based on the following considerations: (1) All in-water work will be completed within the preferred in-water work window for Rock Creek between July 1 and September 30 when UWR steelhead are least likely to be present; (2) isolation of the in-water work area is expected to minimize sediment transport downstream and thus minimize turbidity increases in the action area; (3) any turbidity increases which do occur are expected to be of short duration; (4) because of warm summer water temperatures and lack of suitable rearing habitat, few juvenile UWR steelhead are expected to be rearing in the project area at the time the in-water work is performed; (5) reduced fine sediment input, improved stream shading, and increased habitat complexity from the addition of large wood are expected to result in improved aquatic habitat condition at the project site over the long term; and, (6) the proposed action is not likely to impair properly functioning habitat, or retard the long-term progress of impaired habitat

[2] U.S. Census Bureau, State and County Quickfacts, Washington County, Oregon. any county Available at http://quickfacts.census.gov/qfd/

toward proper functioning condition essential to the long-term survival and recovery of UWR steelhead at the population or ESU scale.

Reinitiation of Consultation

Reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (a) If the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that has an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16).

To reinitiate consultation, contact the Oregon State Habitat Office of NOAA Fisheries and refer to the NOAA Fisheries Number assigned to this consultation (2004/00660).

Incidental Take Statement

Section 9(a)(1) and protective regulations adopted pursuant to section 4(d) of the ESA prohibit the taking of listed species without a specific permit or exemption. Among other things, an action that harasses, wounds, or kills an individual of a listed species or harms a species by altering habitat in a way that significantly impairs its essential behavioral patterns is a taking (50 CFR 222.102). Incidental take refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(o)(2) exempts any taking that meets the terms and conditions of a written incidental take statement from the taking prohibition.

Amount or Extent of Take

NOAA Fisheries expects incidental take to occur as a result of proposed action that will harm, injure, or kill UWR steelhead. Although NOAA Fisheries expects the habitat-related effects of these actions to cause some level incidental take within the action area, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take because of those habitat-related effects. In instances such as these, NOAA Fisheries provides a measurable level of habitat disturbance or change that is causally related to the effects of the proposed action to provide a yardstick for reinitiation. Implementation of the proposed project is expected to result in a short-term increase in stream turbidity at the project site and for some distance downstream and potential for injury or death of individuals during isolation of the in-water work area.

Based on the expected low numbers of juvenile UWR steelhead in Rock Creek at the project site at the time the work is conducted, the potential for take is low. NOAA Fisheries expects that work area isolation, fish salvage, and construction activities associated with the project may

cause non-lethal incidental take of up to 50 juvenile UWR steelhead and lethal take of up to three juveniles. The extent of the incidental take is limited to the project action area.

Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to avoid or minimize take that must be carried out by cooperators for the exemption in section 7(o)(2) to apply. The Corps has the continuing duty to regulate the activities covered in this incidental take statement where discretionary Federal involvement or control over the action has been retained or is authorized by law. The protective coverage of section 7(o)(2) may lapse if the Corps fails to exercise its discretion to require adherence to terms and conditions of the incidental take statement, or to exercise that discretion as necessary to retain the oversight to ensure compliance with these terms and conditions. Similarly, if any applicant fails to act in accordance with the terms and conditions of the incidental take statement, protective coverage may lapse.

The following reasonable and prudent measures are necessary and appropriate to minimize take of listed species resulting from completion of the proposed action. These reasonable and prudent measures would also minimize adverse effects to critical habitat, if any.

The Corps shall:

1. Minimize incidental take from construction activities by applying permit conditions to avoid or minimize disturbance to riparian and aquatic systems.

2. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the Corps and its cooperators must comply with the following terms and conditions, that implement the reasonable and prudent measures described above. Partial compliance with these terms and conditions may invalidate this take exemption or lead NOAA Fisheries to a different conclusion regarding whether the proposed action will result in jeopardy.

1. To implement reasonable and prudent measure #1 (general conditions for construction, operation, and maintenance), the Corps shall ensure that:

    a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.

b. Timing of in-water work. Work below the bankfull elevation[3] will be completed between July 1 and September 30, unless otherwise approved in writing by NOAA Fisheries.

c. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d. Fish screens. Have a fish screen installed, operated and maintained according to NOAA Fisheries' fish screen criteria[4] on each water intake used for project construction, including pumps used to isolate an in-water work area.

e. Maintain stream flow. Bypass water around the dewatered construction site such that flows in Rock Creek downstream from the dewatered area remain approximately equal to flows upstream from the dewatered area.

f. Pollution and Erosion Control Plan. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by surveying or construction operations. The plan must be available for inspection on request by the Corps or NOAA Fisheries.

   i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

      (1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

      (2) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, haul roads, equipment and material storage sites, fueling operations, staging areas, and roads being decommissioned.

      (3) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

      (4) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

      (5) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

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[3] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

[4] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[5]

(1) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

g. Construction discharge water. Treat all discharge water created by construction (*e.g.*, pumping for work area isolation, vehicle wash water) as follows.

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

ii. Pollutants. Do not allow pollutants including contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the 2-year floodplain.

h. Preconstruction activity. Complete the following actions before significant[6] alteration of the project area.

i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.

(1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[7]).

(2) An oil-absorbing, floating boom whenever surface water is present.

iii. Temporary erosion controls. All temporary erosion controls will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.

i. Temporary access roads. All temporary access roads will be constructed as follows.

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[5] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream from the turbidity-causing activity.

[6] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

[7] When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

i. Existing ways. Use existing roadways and travel paths whenever possible, unless construction of a new way would result in less habitat take. When feasible, eliminate the need for an access road by walking a tracked drill or spider hoe to a survey site, or lower equipment to a site using a crane.

ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30% are not authorized.

iii. Minimizing soil disturbance and compaction. Minimize soil disturbance and compaction whenever a new temporary road is necessary within 150 feet[8] of a stream, waterbody or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

(1) Minimize the number of temporary stream crossings.

(2) Vehicles and machinery will cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is complete, obliterate all temporary access roads that will not be in footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the in-water work period.

j. Heavy Equipment. Restrict use of heavy equipment as follows:

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally-sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document

[8] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. 'Channel migration zone' means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years (e.g., alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams).

inspections in a record that is available for review on request by Corps or NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

k. Site preparation. Conserve native materials for site restoration.

i. If possible, leave native materials where they are found.

ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

iii. Stockpile any large wood[9], native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

l. Isolation of in-water work area. If adult or juvenile fish are reasonably certain to be present, or if the work area is 300 feet upstream from spawning habitats, completely isolate the work area from the active flowing stream using inflatable bags, sandbags, sheet pilings, or similar materials, unless otherwise approved in writing by NOAA Fisheries.

m. Capture and release. Attempt to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

i. The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area isolation and competent to ensure the safe handling of all ESA-listed fish.

ii. Do not use electrofishing if water temperatures exceed 18°C.

iii. If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[10]

iv. Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

v. Transport fish in aerated buckets or tanks.

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[9] For purposes of this Opinion only, 'large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[10] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

vi. Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.

vii. Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

viii. Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.

ix. Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

n. Earthwork. Complete earthwork (including drilling, excavation, dredging, filling and compacting) as quickly as possible.

i. Site stabilization. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work unless construction will resume within four days.

ii. Source of materials. Obtain boulders, rock, woody materials and other natural construction materials used for the project outside the riparian area.

o. Site restoration. Prepare and carry out a site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Make the written plan available for inspection on request by the Corps or NOAA Fisheries.

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

(6) Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

ii. Plan contents. Include each of the following elements.

(1) Responsible party. The name and address of the party(s) responsible for meeting each component of the site restoration requirements, including providing and managing any financial assurances and monitoring necessary to ensure restoration success.

(2) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.

(a) A functional assessment of adverse effects, *i.e.*, the location, extent and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.

(b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(3) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(4) Performance standards. Use these standards to help design the plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.

(a) Bare soil spaces are small and well dispersed.

(b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.

(c) If areas with past erosion are present, they are completely stabilized and healed.

(d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.

(e) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.

(f) Vegetation structure is resulting in rooting throughout the available soil profile.

(g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.

(h) High impact conditions confined to small areas necessary access or other special management situations.

(i) Streambanks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris.

(j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(5) Work plan. Develop a work plan with sufficient detail to include a description of the following elements, as applicable.
- (a) Boundaries for the restoration area.
- (b) Restoration methods, timing, and sequence.
- (c) Water supply source, if necessary.
- (d) Woody native vegetation appropriate to the restoration site[11]. This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. This may include allowances for natural regeneration from an existing seed bank or planting.
- (e) A plan to control exotic invasive vegetation.
- (f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.
- (g) Geomorphology and habitat features of stream or other open water.
- (h) Site management and maintenance requirements.

(6) Five-year monitoring and maintenance plan.
- (a) A schedule to visit the restoration site annually for 5 years or longer as necessary to confirm that the performance standards are achieved. Despite the initial 5-year planning period, site visits and monitoring will continue from year-to-year until the Corps certifies that site restoration performance standards have been met.
- (b) During each visit, inspect for and correct any factors that may prevent attainment of performance standards (*e.g.*, low plant survival, invasive species, wildlife damage, drought).
- (c) Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

2. To implement reasonable and prudent measure #2 (monitoring), the Corps shall:

a. Monitoring. Within 120 days of completing the project, the Corps will submit a monitoring report to NOAA Fisheries describing the Corp's success meeting these terms and conditions. This report will consist of the following information.

i. Project identification.

(1) Project name;

(2) Starting and ending dates of work completed for this project; and

[11] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

(3) Name and address of the construction supervisor.

ii. Photographic documentation of environmental conditions at the project site before, during and after project completion.
   (1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre and post construction.
   (2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.

iii. Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream from the project.

b. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the National Marine Fishery Service Law Enforcement Office, at the Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; telephone: 360/418-4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

c. Monitoring reports will be submitted to:

NOAA Fisheries
Oregon State Habitat Office
Attn: 2004/00660
525 NE Oregon Street
Portland, OR 97232

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The consultation requirements of section 305(b) of the MSA direct Federal agencies to consult with NOAA Fisheries on all actions, or proposed actions, that may adversely affect essential fish habitat (EFH). Adverse effects include the direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also

requires NOAA Fisheries to recommend measures that may be taken by the action agency to conserve EFH.

The Pacific Fishery Management Council designated EFH for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Chinook salmon, coho salmon, and Puget Sound pink salmon (PFMC 1999). The proposed action and action area for this consultation are described in the Introduction to this document. The action area includes areas designated as EFH for various life-history stages of Chinook salmon and coho salmon (PFMC 1999). The effects of the proposed action on EFH are discussed above in the ESA portion of this document.

EFH Conservation Recommendations

NOAA Fisheries believes that the following conservation measures proposed by the Corps in the BA along with the reasonable and prudent measures and terms and conditions listed in the ESA portion of this Opinion are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

Statutory Response Requirement

Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse affects that the activity has on EFH. In the response is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

The Corps must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations [50 CFR 600.920(l)].

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